



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) Publication number : **0 552 108 A3**

(12)

EUROPEAN PATENT APPLICATION

(21) Application number : 93400091.0

(51) Int. Cl.⁵ : **G01N 33/58, G01N 33/542,**
// **G01N21/76, G01N21/64**

(22) Date of filing : 15.01.93

(30) Priority : 17.01.92 US 822233

(43) Date of publication of application :
21.07.93 Bulletin 93/29

(84) Designated Contracting States :
DE FR GB IT

(88) Date of deferred publication of search report :
22.09.93 Bulletin 93/38

(71) Applicant : **THE UNIVERSITY OF MARYLAND
AT BALTIMORE**
520 W. Lombard Street
Baltimore Maryland 21201-1027 (US)

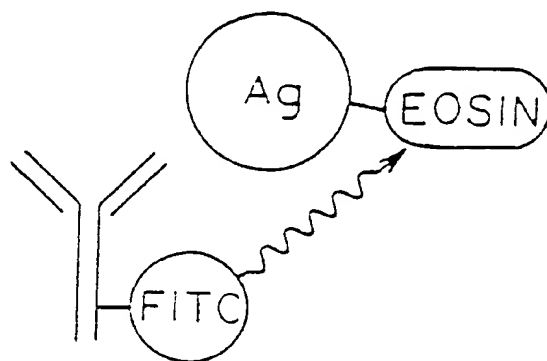
(72) Inventor : **Lakowicz, Joseph**
10037 Fox den Road
Ellicott City, Maryland 21042 (US)
Inventor : **Maliwal, Badri**
2803 North Calvert Street N 1
Baltimore, Maryland 21218 (US)
Inventor : **Thompson, Richard**
7106 Bristol Road
Baltimore, Maryland 21212 (US)
Inventor : **Ozinskas, Alvydas**
5002 Centaurus Court
Dayton, Maryland 21036 (US)

(74) Representative : **Rodhain, Claude et al**
Cabinet Claude Rodhain 30, rue la Boétie
F-75008 Paris (FR)

(54) **Fluorescent energy transfer immunoassay.**

(57) A fluorometric luminescence immunoassay method includes forming a sample by exposing a first immune reaction reactant to a second immune reaction reactant capable of reacting with the first reactant, one of the first and second immune reaction reactants being labelled with a photoluminescent energy transfer donor and the other being labelled with a photoluminescent energy transfer acceptor complementary to the photoluminescent donor. At least the photoluminescent donor has the property of photoluminescence, and the photoluminescent donor and acceptor are chosen so that when the first immune reaction reactant reacts with the second immune reaction reactant, the donor and the acceptor are capable of interacting to produce a detectable luminescence lifetime change. The sample is excited with radiation, and the resulting emission is detected. The apparent luminescent lifetime is then calculated to determine the presence of a reaction product of the first and second immune reaction reactants.

Fig. 1



EP 0 552 108 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 93 40 0091
PAGE1

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	ANALYTICAL CHEMISTRY vol. 59, 1987, COLUMBUS US pages 423 - 427 K.NITHIPATIKOM ET AL. 'Homogeneous immunochemical technique for determination of human lactoferrin using excitation transfer and phase-resolved fluorometry' * the whole document *	1-22	G01N33/58 G01N33/542 //G01N21/76 G01N21/64
X	US-A-4 822 733 (L.E.MORRISON) * column 1, line 59 - column 3, line 42 * * column 4, line 20 - line 23 * * column 13, line 58 - column 14, line 34 * * column 22, line 34 - line 60 *	1-4,6-17	
A	ANALYTICAL CHEMISTRY vol. 56, 1984, COLUMBUS US pages 1400A - 1415A L.B.MCGOWN ET AL. 'Phase-resolved fluorescence spectroscopy' * page 1410A - page 1414A *	1-16	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
A	WO-A-8 707 385 (ETHIGEN CORPORATION) * page 5, line 11 - page 11, line 11 *	1-13	G01N
A	US-A-4 174 384 (E.F.ULLMAN ET AL.) * column 8, line 6 - line 57 *	10,11	
A	EP-A-0 242'847 (ABBOTT LABORATORIES) * the whole document *	10,11	
A	CYTOMETRY vol. 10, 1989, NEW YORK US pages 11 - 19 R.B.MUJUMDAR ET AL. 'Cyanine dye labeling reagents containing isothiocyanate groups' * page 15, column 2, paragraph 2 *	10,11	
		-/--	
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 14 JULY 1993	Examiner DE KOK A.J.
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

EPO FORM 1503 01/92 (P0401)



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 93 40 0091
PAGE2

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
D,A	DYES AND PIGMENTS vol. 17, 1991, LONDON GB pages 19 - 27 D.KEIL * the whole document *	10,11	
A	CLINICAL CHEMISTRY. vol. 25, no. 3, 1979, WINSTON US pages 353 - 361 E.SOINI ET AL. 'Fluoroimmunoassay: present status and key problems' * the whole document *	1,10,11	
P,A	LASER FOCUS WORLD vol. 28, no. 5, May 1992, TULSA US pages 60 - 80 J.R.LAKOWICZ 'Fluorescence lifetime sensing' * page 62 *	19	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 14 JULY 1993	Examiner DE KOK A.J.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1501 01.82 (P0401)